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ABSTRACT

This longitudinal study investigated the influence of social class and family socialization on the development of cognitive competence, educational performance, and academic attainment; the interdependencies between the development of cognitive competence and educational performance; and the impact of social class, family socialization, cognitive competence, and educational performance on academic attainment. Participating were urban Icelandic children and adolescents, from ages 7 through 21 years. Social class was defined by the nature of parents' work, education, and income satisfaction. Restrictive and supportive socialization conditions were classified as factors derived from social network affiliation, time with child, control strategies, and child rearing styles. Cognitive competence was measured at 7, 9, 12, and 15 years by aggregated scores on a battery of Piagetian tasks. Academic performance was measured by grade point average, and educational attainment was represented by the educational level achieved by age 21. Results indicated that social class had a larger impact on educational performance and academic attainment than on individual cognitive competence. Family socialization influenced all outcomes. There was a minor direct influence of cognitive competence on academic attainment, mediated by educational performance. Thus, educational attainment was importantly influenced by social class, while cognitive competence was not. While the results confirm findings about the respective influence of social class and family socialization on the development of competence and educational performance, they differentiate between the effects of background variables and process variables on educational outcomes at different levels. (KB)

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**The linkage between social structure,
competence and academic achievement:
Results of a longitudinal study from age 7 through 21**

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Abstract

We have little empirical knowledge about the link between individual competencies, social performance, and academic achievement. Most studies are restricted to analyses of the influence of either opportunity structures (i.e. income, social status), family socialisation (family structure, rearing styles) or individual development (i.e. cognition) on academic achievement. Thus, the relative contribution of social selectivity, intergenerational transmission and individual competencies on educational attainment processes are not known. In this presentation, three important aspects of academic achievement are analyzed: 1. The influence of social class and family socialization on the development of cognitive competence and educational performance, as well as on academic attainment 2. The interdependencies between the development of cognitive competence and educational performance, and 3. the impact of social class, family socialization, cognitive competence, and educational performance on academic attainment.

The analysis is based on a longitudinal study of urban Icelandic children and adolescents (age 7 through age 21) focussing on the relationship between social structure and individual development. Social class was constructed as a multinomial measure with work positions classified by the nature of work, education and income satisfaction of the parents; restrictive and supportive socialization conditions are classified as factors derived from social network affiliation, time with child, control strategies and rearing styles. Individual competence is measured at ages 7, 9, 12 and 15 years by aggregated scores of cognitive competencies (a battery of Piagetian tasks); educational performance is measured by GPA. Academic attainment is represented by the level of education achieved by age 21.

The results indicate that the impact of social class on individual development is smaller than is its impact on educational performance and on academic attainment. The influence of family socialization is important for all outcome dimensions. The results also evidence only a minor direct influence of cognitive competence on academic attainment, but a significant indirect effect mediated by educational performance. Thus educational attainment is importantly influenced by social class, while cognitive competence is not. While the results confirm findings about the respective influence of social class and family socialization on the development of competence and educational performance they differentiate between the effects of background variables and process variables on educational outcomes at different levels.

Introduction

The link between individual competencies, educational performance, and academic achievement is not well examined. This is surprising because the educational ideal assumes individual modelling of academic achievement, while social structuralists stress the dominant effect of social origin. However, there is little empirical knowledge about domain specific influences of social class and family socialization on the development of competence and educational performance. Moreover, the transmission of class-specific opportunities mediated by family socialization, cognitive competence, and educational performance and determining educational attainment in adulthood is largely unknown.

Two reasons are responsible for the prevailing ignorance:

1. Most studies are restricted to analyses of the influence of either opportunity structures (i.e. income, social status), family socialisation (family structure, rearing styles) or individual development (i.e. cognition, IQ) on academic achievement. Thus, the different impacts of social class, family socialization and cognitive competencies on educational performance have not been analyzed in detail.
2. In general, social class and family socialization have been assumed to exert similar influences on different domains of competence such as educational performance and cognitive competence. This assumption neglects differences in situation driven as well as general competencies which stem from different social influences. Because school performance is framed in the educational system, it is more frequently affected by social selectivity (e.g. class-specific opportunity structures) than cognitive competence (as indicated by Piagetian tasks of concrete and formal operation) which is basically constituted in the communicative structure of the family (Sigel, Stinson & Kim 1993; Burleson, Delia & Allpegate 1995). Therefore, social class and family socialization differ with regard to their respective influence on cognitive competence, school performance and academic achievement.

In this presentation we focus on the question how children from different social classes develop cognitive competence and educational performance differentially and ask whether this development is responsible for the educational attainment of the children at age 21. In addition, we analyze how development is affected by family socialization. Specifically, we shall answer the following questions:

- how does social class and family socialization affect the development of cognitive competence and educational performance differentially?
- how is educational performance influenced by cognitive competence in addition to family socialization?
- how is the educational attainment at age 21 influenced by cognitive competence and educational performance in addition to social class and family socialization.

Data

Subjects: The present analyses are based on a longitudinal study of urban Icelandic children with a focus on the relationship of social structure and individual development (Edelstein, Keller & Schröder 1990). The project aims at studying the relationship between macro-contexts and the micro-processes of individual development, and purports to integrate a sociologically based socialization perspective with a psychological view of developmental dynamics. Therefore, the sample was stratified according to social class, gender, and general ability. The sampling design maximizes the likelihood that the data disclose systematic developmental differences due to important socio-structural factors and contexts of childhood experience.

Sampling design of the Project "Individual development and social structure"

Sample (N = 121)		social class											
competence level at age 7	low	SES 1		SES 2		SES 3		SES 4		SES 5		SES 6	
		M=5	F=6	M=9	F=8	M=4	F=3	M=6	F=5	M=5	F=4	M=5	F=1
	high	M=1	F=5	M=8	F=5	M=6	F=5	M=3	F=6	M=6	F=4	M=6	F=5
	total	17		30		18		20		19		17	

Male; Females

Variables

Social class was measured as a multidimensional configuration of the nature of work, education, and income. It contains six social classes:

1. Unskilled manual workers,
2. skilled manual workers and artisans,
3. lower service class (unskilled clerical workers and civil servants),
4. upper service class (technical, teaching and lower managerial),
5. business, managerial and entrepreneurial,
6. academic professional.

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Socialization variables such as the educational level of the parents, leisure activities, social networks, parents' activities with the child, and rearing styles were assessed at the age of 7 years. In agreement with the literature, family *socialization conditions* (see Table 1) are interpreted as sources of parental support and control strategies (Rollins & Thomas 1979).

To explore the multidimensional, multivariate structure of class specific socialization patterns of supportive and restrictive family conditions a nonlinear canonical component analysis was performed. This method takes into account the overall variance of variables with different levels of measurement in a multidimensional space (see Gifi, 1991; Van DeGeer, 1993).

The supportive factor indicates a discursive, culturally oriented, person-centered and communicative family climate, while the restrictive factor indicates authority based control techniques.

Because of its multinomial level of measurement, social class is located on both dimensions. Therefore it can't be summarized by loading on one socialization factor. While the socialisation patterns will be introduced in the further analysis as sumscores, social classes are introduced as dummies.

Cognitive competence was constructed as an aggregate score across a battery of Piagetian tasks. Tasks of conservation, experimental class inclusion, class inclusion with verbal categories, and logical multiplication were administered in childhood, while with increasing developmental age multiple compensation, syllogistic reasoning, isolation of variables and the pendulum task were presented in adolescence. The score at each measurement point (7, 9, 12, and 15 years) consists of the sum of the means of each concept (assessed by several tasks), divided by the number of concepts.

Educational achievement is measured by GPA at age 7, 9, 12 and 15.

Educational attainment is measured by the educational level the respondents reached at age 21.

Component loadings of socialization variables and social classes (n=121)

variables	loadings	
	support	restrictivity
social class 1. dimension	.66	-.34
social class 2. dimension	-.32	.71
educational level	.61	-.58
cultural orientations	.45	-.22
network (friends)	.49	-.20
network (colleagues)	.52	.08
self-direction/conformity (Kohn-scale)	.53	.16
activities with the child	.57	.36
verbal-supportive rearing styles	.43	.31
punitive-restrictive rearing styles	.27	.54
control over school activities	.12	.61
control over leisure activities	.18	.33
time for the child	.01	.37

Cognitive competence, educational achievement and academic attainment

variables	mean	std.	n
cognition 7* (low - high)	.19	.14	121
cognition 9	.40	.14	105
cognition 12	.58	.15	110
cognition 15	.70	.15	106
GPA 7** (good-fail)	2.71	1.08	121
GPA 9	2.23	.78	121
GPA 12	2.14	.83	121
GPA 15	2.62	.87	121
educational level at age 21***	1.61	.49	106

scales *(0-1); **(1-5); *** (no, apprenticeship, secondary, academic)

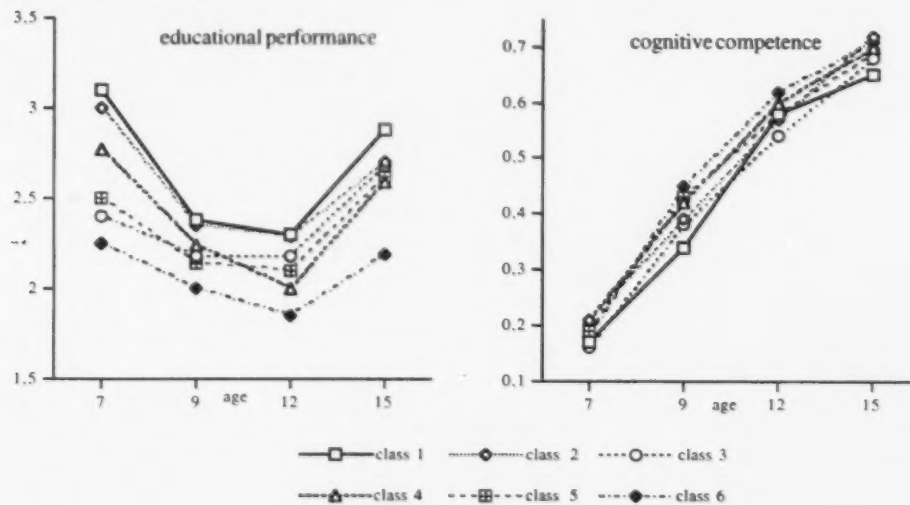
Results

1. Class-specific distributions

In a first step we study the class-specific distributions of school performance and cognitive competence. The analysis evidences that social class has an important influence on school performance, but not on cognitive competence. The class-specific opportunities for educational performance appear to be significant already at the beginning of school and maintain a stable influence over the schooling process. Only in SES 4 the relative position in the hierarchy of social classes changed during the process of schooling. However, in a regression analysis (not reported here), at age 7 children from SES 3 ($\beta .25$), SES 5 ($\beta .25$), and SES 6 ($\beta .35$) show significantly higher grades than children in SES 1 (reference group). At age 15 only children of SES 6 differ significantly in their grades from children in SES 1. Thus, school does achieve some equalization of opportunities as measured by school outcomes.

In contrast, cognitive competence does not differ between social classes significantly. But the analysis evidence an age-specific distribution over social classes. Children of SES 1 have the lowest competence level at age 9, a middle competence level at age 12 and again a low level at age 15.

Class-specific distributions of educational performance and cognitive competence at age 7, 9, 12 and 15



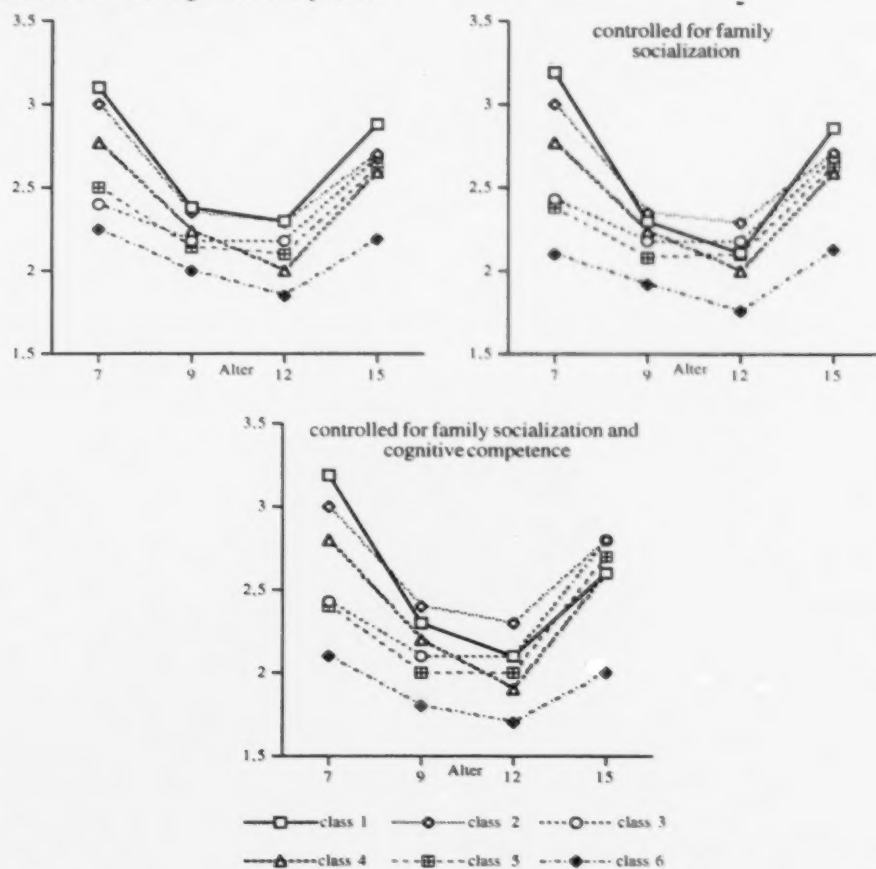
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2. Effects of family socialization and cognitive competence on educational performance

In order to analyze how social origin and cognitive competence affect educational performance differentially, the effect of social class, family socialization and cognitive competence at age 7 were analyzed.

By controlling for family socialization grade increase in SES 1, while in other social classes they do not (*parental support* β -.33**; *parental control* β .26**). This increase is augmented by controlling for childrens cognitive competence additionally. As the effect of family socialization decreases to insignificance by controlling for *cognitive competence* (β -.68**), family socialization affects educational performance mediated by cognitive functioning which is significantly influenced by family socialization (influence on cognitive competence at age 7: *parental support* β .33**; *parental control* β -.24**; analysis not reported here). Thus the analysis confirms both the assumption of the dominant influence of social class - especially at the beginning of the schooling process - and the assumption of an active influence of the individual on his or her educational performance. These influences become apparent only in SES 1 in which the class-specific opportunities produce obvious disadvantage.

Development of educational performance by social class, controlled for family socialization and cognitive competence



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The regression analysis confirms these findings and shows how family socialization and cognitive competence influence educational performance at age 15 in addition to social class and grades at age 12. The significant effect of family socialization (step 1) decrease when controlled for cognitive competence while the explained variance increases (step 2). Controlling for educational performance at an earlier age (step 3), the results show that the effects of family socialization as well as of cognitive competence are to a large extent, and not completely, mediated by the development of educational performance itself.

Hierarchical regression of educational performance at age 15 on family socialization and cognitive competence and GPA at age 12 (β coefficients)¹

	<u>step 1</u>	<u>step 2</u>	<u>step 3</u>
parental control	.28**	.22*	.14*
parental support	-.20+	-.08	.06
cognitive competence at age 15		-.48**	-.18*
GPA at age 12			.65**
R²	.14	.35	.64
R² (change)	.08*	.22**	.28**

F total = 17.4; d.f. = 9; 90

p + .10; * .05; ** .01

¹controlled for social class

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3. Influences on educational attainment at age 21

In order to analyze how these partial effects of cognitive competence and the mediated influences of social class and family socialization predict the educational attainment at age 21 an ordered logit model was performed¹ (Greene 1992).

Regarding educational attainment at age 21, the analysis shows that social class has an important influence (step 1) which in part is mediated by family socialization with an additional significant effect (step 2). In contrast to educational performance, cognitive competence has no effect on educational attainment at age 21 (step 3). Controlling for educational performance at age 15 (step 4) it is clear that the influence of family socialization is partially mediated by educational performance.

Logistic regression of educational attainment at age 21 on social class, family socialization, cognitive competence and school performance (Ordered Logit Model; t-ratios)

	<u>step 1</u>	<u>step 2</u>	<u>step 3</u>	<u>step 4</u>
SES 1		reference group		
SES 2	2.98**	3.11**	3.02**	3.12**
SES 3	2.81**	2.82**	2.79**	3.28**
SES 4	2.62**	1.82+	1.79+	2.25*
SES 5	2.23*	1.60	1.59	2.15*
SES 6	3.31**	2.03*	1.99*	1.99*
parental control		-2.64**	-2.59**	-2.07*
parental support		2.49**	2.47**	1.78+
cognitive competence at age 15			-.25	-.07
GPA at age 15				-3.25**
Constant	-.57	.39	.40	2.74**
Mu (1)	4.82**	4.88**	4.87**	4.87**
Mu (2)	8.13**	8.12**	8.12**	8.25**
R ² _{mf}	.13	.15	.15	.18
log-likelihood	-137.3	-131.0	-131.0	-121.6
chi ²	11.9	24.5	24.5	43.2
d.f.	5	7	8	10

p + .10; * .05; ** .01

Summary

The results indicate that the impact of social class on the development of cognitive competence is smaller than is its impact on educational performance and on educational attainment at age 21. The influence of family socialization is important for all outcome dimensions. The results evidence only a minor direct influence of cognitive competence on educational attainment at age 21, but a significant indirect effect mediated by educational performance at age 15. While the results confirm findings about the respective influence of social class and family socialization on the development of competence and educational performance, they differentiate between the effects of background variables and process variables on educational outcome at different levels. During primary school, family socialization and cognitive competence influence educational performance significantly in certain social classes. These influences mediate class-specific conditions at the beginning of the schooling process. In contrast, secondary education (indicated by educational attainment at age 21) is dominantly affected by social selectivity (indicated by class-specific opportunities and family socialization). Individual competences are of minor importance for these processes. Because of that the results go against the assumption of individual modelling of academic achievement. Only in part, especially in primary school, cognitive competence had an additional effect on educational achievement. In secondary education social class and family socialization play the main role in the status-attainment process.

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